ACC.15
TCT@ACC-i2 | innovation in intervention

A433
JACC March 17, 2015
Volume 65, Issue 10S

## Arrhythmias and Clinical EP

# DOSE-RESPONSE RELATIONSHIP BETWEEN HYPERMAGNESEMIA AND QTC PROLONGATION

Poster Contributions
Poster Hall B1
Sunday, March 15, 2015, 3:45 p.m.-4:30 p.m.

Session Title: Novel Findings in the World of Electrophysiology
Abstract Category: 7. Arrhythmias and Clinical EP: Other
Presentation Number: 1220-258

Authors: *Chayakrit Krittanawong, Charat Thongprayoon, Thoetchai Peeraphatdit, Malcolm Bell, Vitaly Herasevich, Peter Brady, Suraj Kapa, Samuel Asirvatham, Niyada Naksuk, Mayo Clinic, Rochester, MN, USA*

**Background:** Hypomagnesemia is thought to be associated with acquired long QT syndrome. We examined a quantitative relationship between serum magnesium (Mg) levels and QTc interval.

**Methods:** We included 8,512 consecutive patients admitted to the coronary care unit at a single medical center from 2004 to 2013. The mean of serum Mg levels were categorized into <1.8, 1.8-<2.0, 2.0-<2.2 (the reference), 2.2-<2.4 and >2.4mg/dL. Multivariable analysis adjusted for age, sex, serum potassium (K) and ionized calcium (Ca) levels, antiarrhythmic and drugs causing QTc prolongation were used.

**Results:** Unlike serum K and Ca levels, there was a relationship between hypermagnesemia and prolonged QTc interval (Figure). Serum Mg >2.4 and 2.2-<2.4 mg/dL were associated with a 2% (OR 1.02, 95% CI 1.00-1.02) and a 1% (OR 1.01, 95% CI 1.01-1.03) increase in risk of lengthening QTc interval, while Mg <1.8 and 1.8-<2.0 mg/dL were a protective factor (OR 0.98, 95% CI 0.97-0.98 and OR 0.99, 95% CI 0.98-0.99, respectively), compared with the reference group. After excluding patients with other electrolyte abnormalities or on antiarrhythmic drugs or calcium channel blockers, Mg <1.8 and 1.8-<2.2 mg/dL were still associated with a shortening QTc (OR 0.97, 95% CI 0.96-0.99 and OR 0.98, 95% CI 0.97-0.99, respectively).

**Conclusion:** Contrary to the conventional knowledge, a relationship between incremental serum Mg levels and prolonged QTc was demonstrated. Further studies are needed to determine clinical significance of this finding.